CARGILL SALT

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1999-2000

September 13, 2000

Lieutenant Colonel Timothy S. O'Rourke
District Engineer
U.S. Army Corps of Engineers
San Francisco District
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San Francisco, CA 94105-2197

Attention: Mark D'Avignon, Project Manager
Regulatory Functions Branch

Mr. William Travis
Executive Director
San Francisco Bay Conservation and Development Commission
30 Van Ness Avenue, Suite 2011
San Francisco, CA 94102-6080

Attention: Ande Bennett, Coastal Permit Analyst

Subject: Cargill Maintenance Report
Cargill Salt Files: 2000.005:0a and 2000.012:131
COE File: 19009S98
BCDC File: 4-93

Dear Colonel Grass and Mr. Travis:

Enclosed is Cargill's **sixth** report of completed maintenance activities as required by our Corps of Engineers and San Francisco Bay Conservation and Development Commission permits. Our purpose is to look back in time, report on completed activities, assess the impacts, if any, of the maintenance activities and the success of our Best Management Practices. We also provide, as best as we can, an advanced look at activities that may be of interest to agencies and the public. The BCDC and Corps permits have similar requirements. This is a joint report to both agencies.

Very soon, you will be receiving a major review of our maintenance efforts

Significant events or activities that will occur, in the future, well out in the reporting cycle are discussed below:

A significant project that was not listed in the work plan for 1999-2000 is noticed as a supplemental item in this report. A new siphon between Ponds 1 and 2 in Plant 1 is needed. The hydraulic capacity of the existing siphon has been severely restricted by the buildup of calcium sulfate, or "gypsum." This is common in the salt industry where velocity and temperature changes in pumps and pipeline structures often cause the precipitation of salts and related compounds. This siphon will eventually connect to surface pipelines, placed on levee tops for the Redwood City, Plant 1 and Plant 2 operations to allow better movement and control of brines and bitterns and to provide for interoperability between the Newark and Redwood City pond systems. Detailed construction plans and a proposed schedule will be published shortly for review by regulatory agencies.

More efficient intakes, better movement and control of higher salinity brines in Redwood City, Plants 1 and 2 will remain a goal for Cargill. That will involve the construction of new intakes, reconfiguration of internal levees and some changes in historic salinity levels in certain ponds. As required by the permits, these anticipated changes are being noted in this year's report. These proposed changes will be published in detail in the March of 2001 maintenance report proceeding construction and ample opportunity for regulatory and public comment will be provided.

These activities are also discussed in the narrative along with our mitigation checklist for dredge lock entries. Returning to our initial comments, this report represents the best efforts of Cargill Salt employees in maintaining our solar salt production facilities in a sensitive environment. Many employees safely contributed hundreds of hours to maintenance activities and compilation of this report itself represents many person hours of effort. To our knowledge, this report is the most extensive of its kind in the Bay Area. Completed work is measured in terms of tens of lineal feet and tens of cubic yards of riprap across thousands of acres of our solar system and this effort itself has been integrated into our maintenance planning cycle. Copies of this report and the attachments are being sent to the extensive distribution list developed during permit negotiations.

SUPPORTING NARRATIVE
AUGUST 31, 2000
REPORT BY CARGILL SALT
WORK COMPLETED AND ADVANCE NOTIFICATION

1. COMPLETED WORK

A. Dredge Work Cargill's dredge, *The Mallard*, operated primarily in the Plant 1 system after exiting the Baumberg system, where it had topped the new levee separating the mitigation site from the adjoining production pond. Since the lock had not been entered for several years, the marsh surrounding the lock was extensive. The access path to the lock was too long for the dredge to traverse and still minimize placement of the dredged muds. A long-reach excavator was brought in to assist the dredge in the entry. The use of land-based equipment allowed less dredging by the *Mallard.* The *Mallard* will remain in the Plant 1 system until July of 2001. At that point in time, the dredge will exit the lock at Pond 2A and enter the Plant 2 system at Pond 4. That activity was noticed in the submittal of the 2000-2001 maintenance work plan and remains unchanged.

LAND-BASED EXCAVATOR ASSISTING *MALLARD*

Besides routine levee maintenance and topping, the dredge excavated a number of gaps through existing levees to allow more highly concentrated brines to be forced south, towards the final evaporation ponds. This modification is representative of the type of internal improvement needed to continue to produce sufficient tonnage each year with a reduced evaporative area. Higher salinity evaporation ponds must be kept full of brines to continue the evaporative process

The permit required 5,000 lineal feet of beach to be constructed, and 5,200 lineal feet were constructed by carefully placing dredged muds against the levee and smoothing out the muds with the dredge bucket. Photo points for future studies of Plover use have been installed.

NEW SNOWY PLOVER HABITAT CONSTRUCTED BY THE *MALLARD*

3. REVIEW OF BEST MANAGEMENT PRACTICES AND ON-GOING IMPROVEMENTS TO OPERATIONAL PRACTICES

At this mid-point in the 10 year permit, all best management practices (BMPs) required of Cargill Salt have been implemented. Previous completion reports, issued in August of the last five years have detailed those BMPs and the success Cargill's operations staff has realized in their implementation. Best management practices authorized by both permits are reproduced as Appendix 1 and 2 to this report. In addition, a comprehensive five-year review is being published concurrently that includes an extensive discussion of the best management practices.

4. ADVANCE AND SUPPLEMENTAL NOTIFICATION OF FUTURE ACTIVITIES – Next Annul Work Period through May 2002

This section presents our best forecast of the types of activities we anticipate for the upcoming work period of June 2001 through May 2002 and beyond. The primary factor is the need to reconfigure solar salt operations in the Bay Area to reflect the potential sale of approximately 19,000 acres of salt ponds to the U.S. Fish and Wildlife Service and the California Department of Fish and Game. At this writing, that major land transaction has not been agreed upon by the parties. However, in anticipation of the removal of thousands of acres from solar salt production, Cargill's operations need to become more flexible, cost efficient and more effective in producing high quality brines to support a sustainable tonnage for harvest each year.

Besides operational changes in the active salt ponds, interim infrastructure will possibly be needed in salt ponds scheduled for transfer. Possible, additional intake structures are noted on the graphic exhibit provided in this submittal. These brine control structures could provide a transition from brine to bay water management in the interim period while restoration planning is underway.

A continuing focus is the collaboration with the Santa Clara Valley Water District. The sale of salt pond A4 in Alviso to the SCVWD transferred ownership, but solar salt operations continue while the district completes planning and permitting for resoration of Pond A4. An additional area of joint interest is the repeated flooding of our Alviso system. That possibility remains a threat to solar salt operation. We plan to work cooperatively with the district staff to address these issues. However, the SCVWD's planning effort remains in the initial stages, and we do not have any definitive projects to report at this time.

One completed joint project was the levee topping along Pond A5 adjacent to Guadalupe Slough. The Santa Clara Valley Water District requested that Cargill undertake a section of levee maintenance on behalf of the district. The lower reach of the Guadalupe provides an important flood conveyance function. This particular reach of the levee has continually eroded and previous efforts by the district to strengthen the levee using land-based equipment had not been completely successful.

The levee was topped from the slough and that effort was illustrated in the previous photograph.

That project will require extensive coordination with both the City of Fremont and the Alameda County Flood Control District.

Specifics on dredge lock entries and exits are detailed on the tables following this section.

Cargill Salt Completed Workplan 1999 - 2000
San Francisco District Corps of Engineers Permit 19009E98
San Francisco Bay Conservation and Development Commission Permit 4-93

SHADED AREAS INDICATE WORK COMPLETED

- Redwood City -

Location	Ponds Involved	Activity[1]	Duration of Activity	COE[2]	BCDC[2]	Size/Scope	Comments
REDWOOD CITY	1-10, 7A, 7B, 7C, 8E, 8W, 9A, & SF2	Grading	Ongoing May through August	N/A	2b		Routine grading of levee top to provide vehicle access. Where present, grading will not occur in active WSP/seabird nesting areas.
	1	Discing	Ongoing May - August	N/A	2b		Discing dredged muds placed on levee top.
	1	Rip-rap	Ongoing through August	1e	1c	336 lf, 224 cy	Maintenance of existing rip-rap areas.
	1	Levee topping "Mallard"	Sep 2000 through Jan 2001 (Depending on bird survey results)	2a	2a	6,800 lf	Top levee using slough muds from Ravenswood Slough, 1,800 lf and spot top bay shore levee 5,000 lf outside of salt pond.
	1	Other work	Ongoing Sep 2000 through Jan 2001				Install up to two 60" intake pipes and trash racks. (System improvements) with Dredge "Mallard" from "inside pond".
	3	Other work	Ongoing	1a	2b		Repair or replace 36" gate at Ravenswood Siphon.

[1]All routine grading of levee top to provide discing and rip-rapping are routine, preventive maintenance activities unless otherwise identified.
[2]Many activities identified in the work plan are outside COE/BCDC authority/jurisdiction. These are identified in the workplan for completeness and information only. Where there is tentative agreement between COE/BCDC and Cargill that these activities are outside the jurisdiction area, these areas are marked "N/A". The Corps and BCDC will make the final determination.

Cargill Salt Completed Workplan 1999 - 2000
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SHADED AREAS INDICATE WORK COMPLETED

Location	Ponds Involved	Activity[1]	Duration of Activity	COE[2]	BCDC[2]	Size/Scope	Comments
REDWOOD CITY	7C	Other work	Ongoing to May	1a	2b		Replace pipe and screw gate from pumping donut at 7C brine feed ditch for 7B.
	8E	General levee maintenance				4,000 lf	Build up levee berm with land-based equipment.
	9A	General levee maintenance	Ongoing	N/A	2a	300 lf	Spot key levee as needed.
	10	General levee maintenance	Ongoing	2a	2a	150 lf	Spot key levee as needed.
	10	Discing	Ongoing May - August	N/A	2b		Discing dredged muds placed on levee top.
	S5	Levee topping "Mallard"	Sep 2000 through Jan 2001 (depending on bird survey results)	2a	2a	4,000 lf	Top with dredged muds, majority of system.
	SF2	Discing	Ongoing May - August				Discing dredged muds placed on levee top.

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excerpt for M Report on Newark Restoration

2.2 *Sedimentation Rates*

In October 1995, ten permanent monitoring stations were established within the mitigation site to record sediment accretion rates (Figure 2). A sliding gauge was developed to be used with a marking stake to measure accretion or erosion at each station. Baseline data were collected on February 15, 1996. Annual accretion rates at each station were determined for the period of July 1999 to June 2000.

2.3 *Vegetation Establishment*

Vegetation was monitored by ground-based observations to determine initial colonization and to determine the extent of invasion by non-native species. Photos were taken from permanent points along the perimeter of the wetland to further document vegetation establishment. Baseline photos were taken in March 1996. Locations where plants were initially establishing were recorded as well as any locations where non-native *Spartina alterniflora* was present. Ground-based vegetation observations will be made annually. An aerial photo taken in October 1999 was also used to facilitate mapping of wetland vegetation.

3.0 RESULTS AND DISCUSSION

3.1 *Tidal Action*

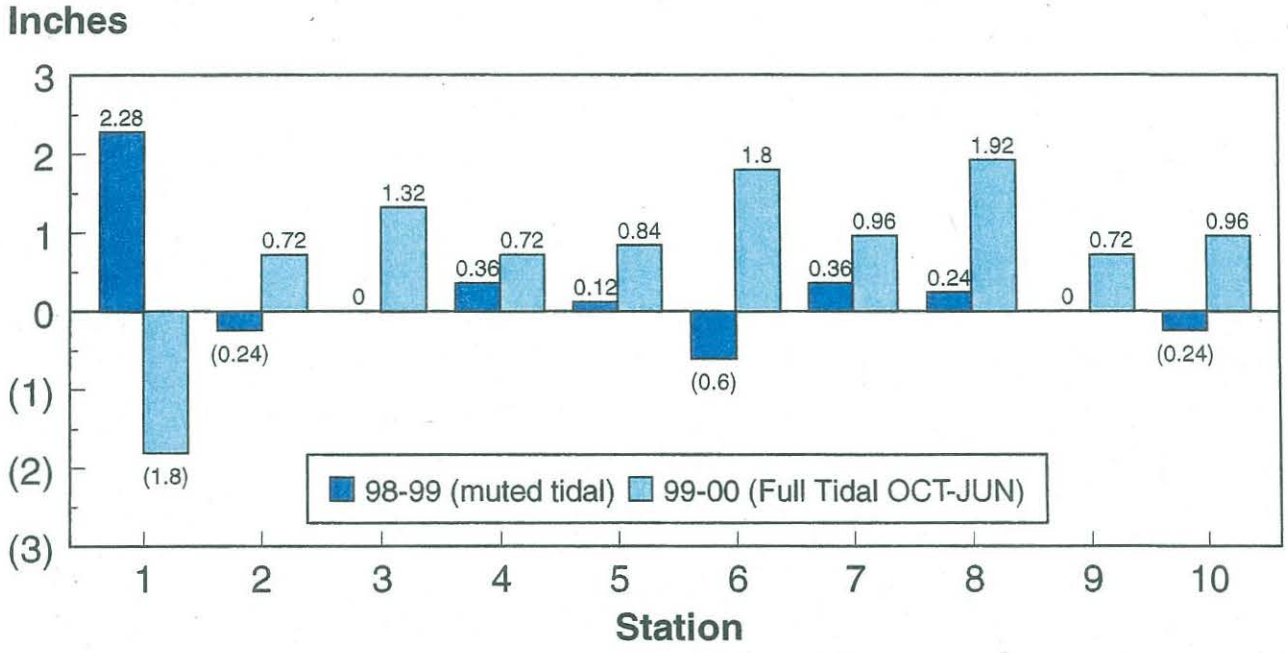
At present, the full tidal cycle results in complete inundation and exposure of mudflats and portions of former borrow ditches. As determined in 1996, there is an approximate 30 minute lag between high tide in the bay and the slough located outside of the tide gate. At low tide, the entire mitigation site is exposed. The tidal slough bottom elevation is approximately 0 feet NGVD. Wet soil observed around the perimeter of the site indicates that high tides may inundate the site as much as one foot higher than during muted tide conditions; however, the installation of tide gauges in the 6th year of monitoring will determine the actual tidal range.

3.2 *Sedimentation Rates*

Performance of the mitigation site in creating the desired habitat types is directly related to the rate of sedimentation and colonization by marsh plants. Prior to introducing muted tidal action, the elevations of the pond bottom were slightly too low for marsh plant establishment. Approximately 6 to 12 inches of sedimentation are needed over the marsh plain for marsh plants to become established. Sliding gauge measurements found the 1999-2000 average annual rate of sedimentation at the ten stations (0.816 inch [0.068 feet]) to be over five times greater than that observed in 1998-99 during muted tidal operation (0.156 inch [0.013 feet]). When considering only the stations where accretion occurred (tidal channel erosion occurred at Station 1), the average annual rate of sedimentation was 1.11 inches (0.092 feet), which is seven times greater than that observed in 1998-99 ten-station average. Most monitoring stations showed substantial increases in accretion following the introduction of full tidal conditions (Figures 3 and 4). It

ANNUAL SEDIMENT ACCRETION

Muted Tidal Compared to Full Tidal



TOTAL SEDIMENT ACCRETION

February 1996 - June 2000

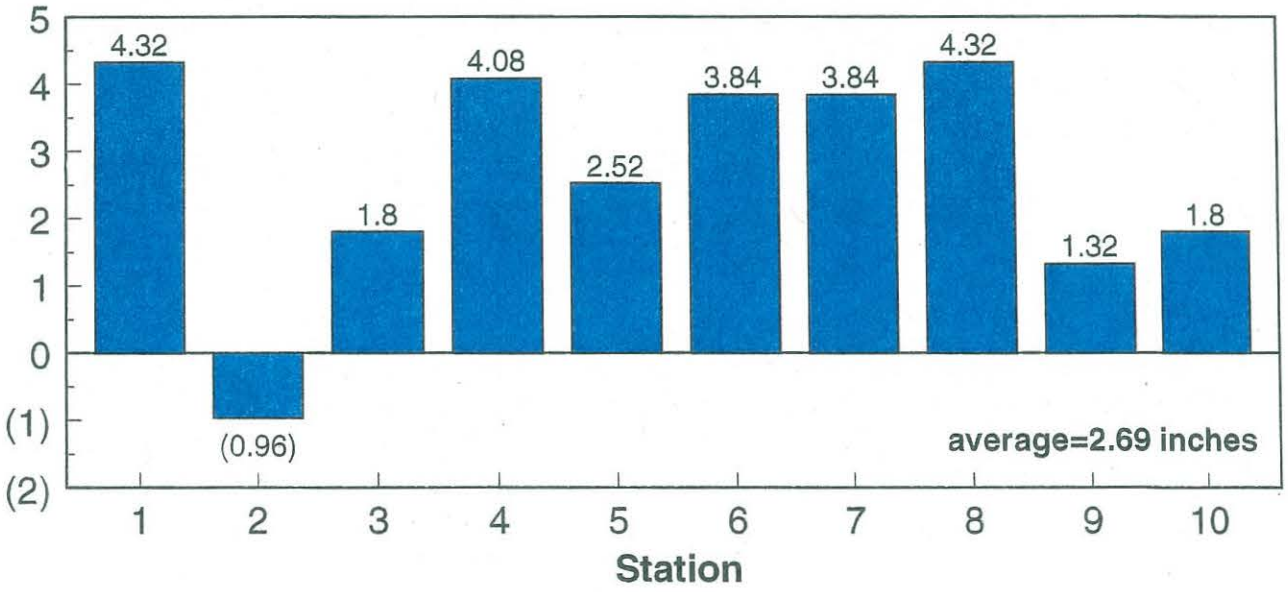


Figure 3. Annual accretion rates and total accretion/erosion in inches at each monitoring station at the Pond B-1 Mitigation Site. Annual rates were based on accretion occurring between July 1999 and June 2000.

Wetlands Research Associates, Inc.

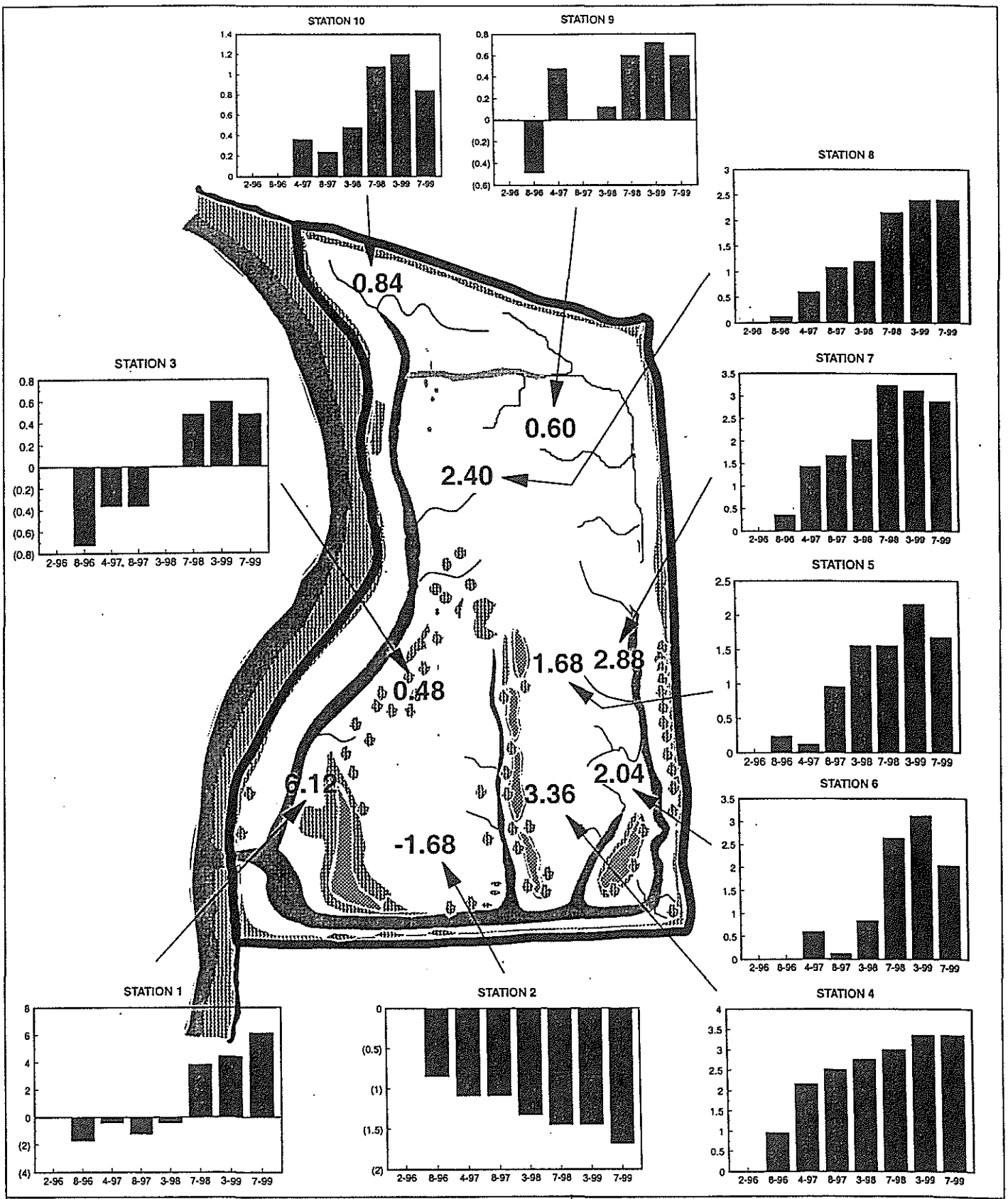


Figure 4. Map of Pond B-1 Mitigation Site showing total accretion/erosion (inches) since February 1996 and comparison between stations.

Wetlands Research Associates, Inc.